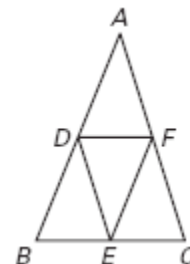


Geometry Date_____ 5.4 Assignment
Midsegment Theorem (pp 287–289)

1. What is your name?

Use the diagram of $\triangle ABC$ where D, E, and F are the midpoints of the sides.



2. Name the segment parallel to \overline{DE} .

\overline{AC}

3. Name the segment parallel to \overline{FE} .

\overline{AB}

4. If $AB = 21$, what is EF ?

10.5

5. If $BE = 7$, what is DF ?

7

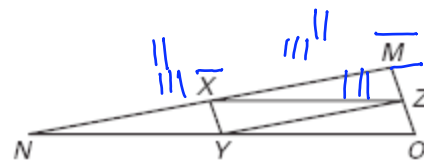
6. If $DE = 10.2$, what is AC ?

20.4



Geometry Date_____ 5.4 Assignment
Midsegment Theorem (pp 287-289)

Use the diagram of $\triangle MNO$ where X, Y, and Z are the midpoints of the sides.



7. If $YZ = 2x + 3$ & $MN = 5x - 14$, what is the length of YZ?

$$2(2x+3) = 5x-14$$

$$4x+6 = 5x-14$$

$$20 = x$$

(43)

8. If $YX = 3x - 4$ & $MO = 9x - 20$, what is MO?

$$2(3x-4) = 9x-20$$

$$6x-8 = 9x-20$$

$$12 = 3x$$

$$x=4$$

(16)

9. What triangles appear to be congruent to $\triangle XYN$?

$\triangle MZX$

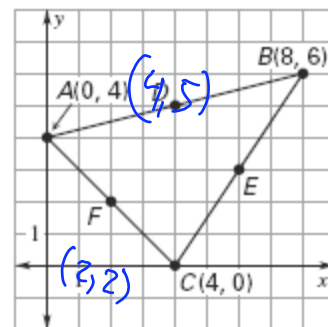
$\triangle ZOY$

$\triangle XZ$

Geometry Date_____ 5.4 Assignment Midsegment Theorem (pp 287-289)

10. Find the coordinates of the endpoints of each midsegment.

O (4, 5)
E (6, 3)
F (2, 2)



11. Use the slope and distance formula to verify that the Midsegment Theorem is true for \overline{DF} .

$$\text{Slope of } \overline{DF} = \frac{3}{2}$$

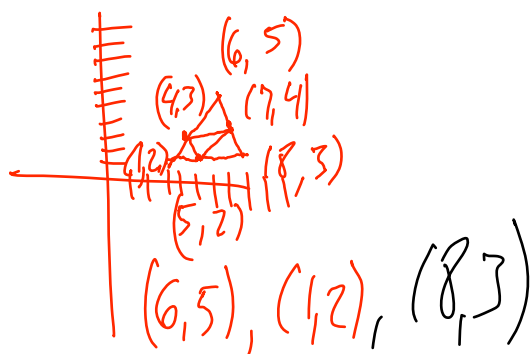
$$DF = \sqrt{9 + 4} = \sqrt{13}$$

$$\text{Slope of } \overline{BC} = \frac{6}{4} = \frac{3}{2}$$

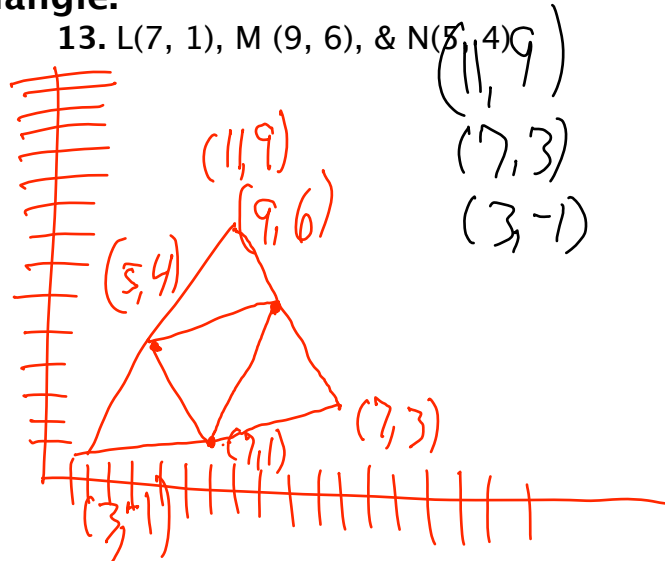
$$BC = \sqrt{36 + 16} = \sqrt{52} = 2\sqrt{13}$$

You are given the midpoints of the sides of a triangle. Find the coordinates of the vertices of the triangle.

12. L(4, 3), M(7, 4) & N(5, 2)



13. L(7, 1), M(9, 6), & N(11, 4)



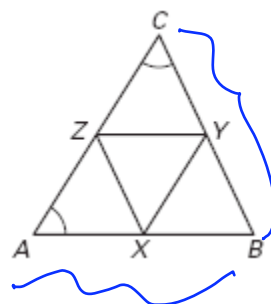
Geometry Date_____ 5.4 Assignment Midsegment Theorem (pp 287-289)

14. Fill in the blanks of the paragraph proof.

Given: $\angle A \cong \angle C$
X, Y, & Z are the midpoints of $\triangle ABC$.

Prove: $\triangle XYZ \cong \triangle XYB$

Given that $\angle A \cong \angle C$, you know that $\overline{BC} \cong \overline{AB}$ because



_____. Since X, Y, and Z are midpoints, you know that

$XY = \frac{1}{2}$ AC, & $XZ = \frac{1}{2}$ BC, by Midsegment thm. Since BC
XB YB

= AB it follows that $ZY = \overline{XY}$ and $XZ = \overline{XY}$ by

substitution. By the reflexive property of congruence

SSS
_____ \cong _____. Therefore $\triangle XYZ \cong \triangle XYB$ by _____.

Review.

Solve the equation and state a reason for each step. (Chapter 2 Section 4).

15. $3x + 13 = 46$ Given

$$\begin{array}{l|l} 3x = 33 & - = \\ x = 11 & \div = \end{array}$$

16. $5x + 12 = 9x - 14$ Given

$$\begin{array}{l|l} 12 = 4x - 14 & - = \\ 26 = 4x & + = \\ 6.5 = x & \div = \end{array}$$

Geometry Date_____ 5.4 Assignment Midsegment Theorem (pp 287-289)

17. $9(3x + 10) = 27$ *Given*

$$3x + 10 = 3 \quad \div =$$

$$3x = -7 \quad - =$$

$$x = -\frac{7}{3} \quad \div =$$

18. $3x + 2(x + 5) = 40$ *Given*

$$3x + 2x + 10 = 40$$

$$5x + 10 = 40$$

$$5x = 30$$

$$x = 6$$

Distributive

Combine like terms

$$- =$$

$$\div =$$

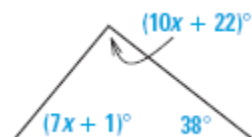
Find the value of x . (Chapter 4 Section 1)

19.



$$x = 23$$

20.



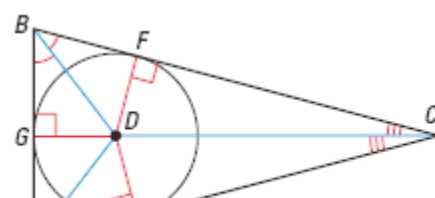
$$x = 7$$

21.



$$x = 18$$

\overline{AD} , \overline{BD} , & \overline{CD} are angle bisectors of $\triangle ABC$.



Geometry Date_____ 5.4 Assignment

Midsegment Theorem (pp 287-289)

22. Explain why $\angle CAD \cong \angle BAD$ & $\angle BCD \cong \angle ACD$.

23. _____ What name is name is given to the point of concurrency, D?

- A. Incenter
- B. Circumcenter

24. Explain why $\overline{DE} \cong \overline{DG} \cong \overline{DF}$.

25. Suppose $CD = 10$ and $EC = 8$. Find DF .

def. of \angle bisector.

A

10

8

Concurrence of \angle bisectors

6



"It started as just a skirmish, your majesty, and suddenly escalated into a hockey game!"